



## THE COLLEGES OF MEDICINE OF SOUTH AFRICA

Incorporated Association not for gain  
Reg No 1955/000003/08

Primary Examination for the Fellowship of the  
College of Maxillofacial and Oral Surgeons of South Africa

26 June 2018

Paper 2

Physiology

(3 hours)

*All questions to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)*

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- 1 With respect to the Nervous System, write brief notes on the following, giving appropriate examples where necessary
  - a) Generation and propagation of a neuronal action potential. (5)
  - b) The cranial nerves. (5)
  - c) The autonomic nervous system. (15)[25]
  
- 2 With respect to the Immune System, answer the following questions
  - a) Discuss the similarities and differences between cell mediated and antibody mediated immunity. Include in your answer: the specific cells involved in each of these processes, the specific cell receptors involved in each of these processes and how each of these systems provide protection against non-self. (10)
  - b) What are the major histocompatibility complex MHC I and MHC II molecules and what are their functions? (10)[20]
  
- 3 Answer the following questions which relate to Renal Physiology
  - a) List the major functions of the kidneys? (5)
  - b) Describe the processes of filtration, absorption and secretion, giving appropriate examples to illustrate your answers. (10)
  - c) What is the mechanism that explains the voluntary control of urination? (5)
  - d) Describe the action of antidiuretic hormone (ADH) on the kidney. (5)[25]
  
- 4 With respect to the Respiratory System, answer the following questions
  - a) What cells produce surfactant and what is the function of surfactant within the respiratory tract? (5)
  
  - b) Describe the mechanism that allows for air to move into and out of the lungs. Be sure to include how pressure gradients are established and how this determines the direction of air flow. (5)[10]

- 5 Fever is the physiological response to infection by pathogens. Briefly describe the physiology of fever under the following headings
- a) The release and actions of the endogenous mediators of fever. (10)
  - b) The physiological mechanisms that result in the elevation of body temperature. (5)
  - c) Endogenous inhibitors of fever. (5)
  - d) Pharmacological inhibitors of fever. (5)
- [25]
- 6 In the Cardiovascular System, the regulation of blood pressure (BP) is an important example of homeostasis. Describe the physiology of blood pressure (BP) regulation under the following headings
- a) Nervous components in the regulation of blood pressure. (10)
  - b) Hormonal components in the regulation of blood pressure. (10)
- [20]
- 7 Hormones are involved in numerous physiological functions. Answer the following questions which relate to the Endocrine System
- a) List the three different types of hormones, based on their chemical structure and give examples of each. (6)
  - b) The pituitary gland is often described as being “the Master gland”. What is the reason for that description being applied? (9)
  - c) Describe what is meant by the term “negative feedback” and give a suitable example. (5)
- [20]
- 8 List five functions of the liver. (5)



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Paper 3 Principles of pathology including microbiology (3 hours)

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- 1 a) Describe the different morphological patterns of acute inflammation. (10)  
b) Several reactions occur in the blood vessels in acute inflammation. Discuss the following vascular changes  
i) Changes in vascular flow and calibre. (4)  
ii) Vascular Permeability (Vascular Leakage). (3)  
c) Briefly discuss the factors that impair the repair of tissue. (8)  
[25]
- 2 a) Define haemorrhage, describe the different appearances and the clinical implications. (10)  
b) Discuss the fate of a thrombus. (8)  
c) Describe the morphology of the different types of infarcts that can occur. (7)  
[25]
- 3 a) Hypersensitivity reactions can be subdivided in four types. Briefly describe the different types, including the immune mechanism, the pathological lesions associated with the type and the clinical disorder. (12)  
b) Acquired immunodeficiency syndrome (AIDS) has a spectrum of clinical manifestations in the terminal phase. Briefly discuss the following components  
i) Opportunistic infections. (7)  
ii) Tumours. (6)  
[25]
- 4 a) Briefly compare the characteristics features of benign and malignant tumours. (5)  
b) Aneurysms can occur commonly in the aortic arch, abdominal aorta or in smaller arteries. Briefly discuss the following regarding aneurysms  
i) Define true and false aneurysms. (2)  
ii) Macroscopic appearance of abdominal aorta aneurysm. (3)  
c) Define and briefly describe the pathology of Giant cell (temporal) arteritis. (5)  
d) Discuss the following components of myocardial infarction  
i) Patterns of infarctions. (3)  
ii) Complications of acute myocardial infarction. (7)  
[25]